

Claims

1. A method for preventing and/or suppressing growth of transgenic plants, which were grown on a field, in subsequent seasons among a population of other plants on said field or neighboring fields comprising the steps of:
 - i) providing seeds of a transgenic plant comprising at least one first expression cassette comprising a nucleic acid sequence encoding a D-amino acid oxidase operably linked with a promoter allowing expression in plants, in combination with at least one second expression cassette suitable for conferring to said plant an agronomically valuable trait, and
 - ii) in a first season sowing said seeds on a field, growing said transgenic plants, and harvesting the resulting plant products,
 - iii) providing at least one compound M, which is non-phytotoxic or moderately phytotoxic against plants not comprising a transgenic expression cassette for a D-amino acid oxidase, wherein said compound M can be metabolized by said D-amino acid oxidase into one or more compound(s) N which are phytotoxic or more phytotoxic than compound M, and
 - iii) in a subsequent season preventing and/or suppressing growth of said transgenic plants on said field or neighboring fields or areas, where other plants are grown or growing not comprising a transgenic expression cassette for a D-amino acid oxidase, by treating said fields or areas with said compound M in a concentration, which is non-phytotoxic against said other plants, but which is - in consequence of the metabolism into compound(s) N - phytotoxic against said transgenic plants thereby selectively preventing or suppressing growth of said transgenic plants.
2. The method of Claim 1 wherein said second compound M is comprising a D-amino acid structure selected from the group consisting of D-isoleucine, D-valine, D-asparagine, D-leucine, D-lysine, D-proline, and D-glutamine, and derivatives thereof.
3. The method of Claim 1 or 2 wherein said second compound M is selected from the group consisting of D-isoleucine and D-valine.

4. The method of any of Claim 1 to 3, wherein said D-amino acid oxidase expressed from said first expression cassette has preferably metabolizing activity against at least one D-amino acid and comprises the following consensus sequence:

5 [LIVM]-[LIVM]-H*--[NHA]-Y-G-x-[GSA]-[GSA]-x-G-x₅-G-x-A

wherein the amino acid residues given in brackets represent alternative residues for the respective position, x represents any amino acid residue, and indices numbers indicate the respective number of consecutive amino acid residues.

10

5. The method of any of Claim 1 to 4, wherein said D-amino acid oxidase is described by a sequence of the group consisting of sequences described by GenBank or SwisProt Acc.No. JX0152, O01739, O33145, O35078, O45307, P00371, P14920, P18894, P22942, P24552, P31228, P80324, Q19564, Q28382, Q7PWX4, Q7PWY8, Q7Q7G4, Q7SFW4, Q7Z312, Q82MI8, Q86JV2, Q8N552, Q8P4M9, Q8PG95, Q8R2R2, Q8SZN5, Q8VCW7, Q921M5, Q922Z0, Q95XG9, Q99042, Q99489, Q9C1L2, Q9JXF8, Q9V5P1, Q9VM80, Q9X7P6, Q9Y7N4, Q9Z1M5, Q9Z302, and U60066.

20

6. The method of any of Claim 1 to 5 wherein said D-amino acid oxidase is selected from the group of amino acid sequences consisting of
- a) the sequences described by SEQ ID NO: 2, 4, 6, 8, 10, 12, and 14, and
 - b) the sequences having a sequence homology of at least 40% with a sequence as described by SEQ ID NO: 2, 4, 6, 8, 10, 12, and 14, and
 - c) the sequences hybridizing under low or high stringency conditions with a sequence as described by SEQ ID NO: 2, 4, 6, 8, 10, 12, and 14.

30

7. A selective herbicidal composition comprising at least one compound M, wherein M is comprising a D-amino acid structure selected from the group consisting of D-isoleucine, D-valine, D-asparagine, D-leucine, D-lysine, D-proline, and D-glutamine, and derivatives thereof.
- 35
8. The selective herbicidal composition of Claim 7, comprising at least one compound selected from the group consisting of D-isoleucine, D-valine, and derivatives thereof.

9. Use of a compound M as defined in Claim 7 or 8 or a selective herbicidal composition of Claim 7 or 8 to prevent or suppress unwanted growth of transgenic plants.